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Substance Use Among Alberta Adolescents:

Prevalence and related factors

THE PREMIER'S COUNCIL IN SUPPORT OF
ALBERTA FAMILIES

SUBSTANCE USE AMONG ALBERTA ADOLESCENTS: PREVALENCE AND RELATED FACTORS

by

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1.0 Introduction

The use and abuse of cigarettes, alcohol, and/or illicit drugs by young people is a major concern to Alberta families. In a broader context, substance use and abuse among adolescents has become a primary social and public health issue. As a consequence, the Alberta Family Life and Substance Abuse Foundation (AFLSAF) was created, and given the mandate of promoting research designed to examine the extent of, and factors associated with, substance use and abuse within Alberta families and, in particular, among Alberta youth. With the support of the Premier's Council in Support of Alberta Families, the Canadian Research Institute for Law and the Family (CRILF) developed this project and approached AFLSAF for funding.

1.1 The Problem

Adolescence is generally recognized as a time when many individuals are at greatest risk to begin using and abusing a variety of substances. In fact, it has been suggested that adolescents who have not experimented with cigarettes, alcohol, or other drugs by their mid-teens are unlikely to do so thereafter. The high profile granted adolescent substance use in the United States and Canada has generated a substantial body of research on the extent of the problem, as well as the personal and social factors that may be related to the use and abuse of cigarettes, alcohol, and other drugs.

Large-scale drug-use surveys conducted in the United States (most notably the National Household Survey on Drug Abuse conducted biennially since 1971 and the Monitoring the Future Survey conducted annually since 1975), and in Canada (in particular the Ontario Student Drug Use Survey conducted biennially since 1977) have been instrumental in identifying the actual extent of drug use among adolescents and monitoring the long-term trends in the use of a variety of substances. Numerous other cross-sectional and longitudinal studies have examined adolescent drug-use patterns in smaller geographic areas. In fact, these types of drug-use surveys characterize much of the research conducted in Canada, which generally has a provincial focus, because health and education issues typically fall within provincial versus federal jurisdiction (Mitchell, 1991). Overall, the results of these studies suggest that adolescent use of cigarettes, alcohol, and most other drugs has been steadily declining throughout the 1980s and early 1990s. Despite this downward trend, however, the prevalence rates for lifetime, annual and monthly use suggest that a significant number of adolescents are continuing to use and abuse a variety of substances.

Equally important are the large number of studies that have investigated the antecedents and determinants of initiation into and maintenance of drug-using behaviour. Through these studies, several factors have been implicated in the initiation and continuation of adolescent drug use. For example, several demographic factors such as age, gender, and religion have been shown to be related to drug use. In addition, social environmental factors such as poor family functioning, poor parent/child relationships, parent drug use, peer drug use, poor school

performance, a negative overall school climate, and low involvement in extracurricular activities have also been linked to substance use among adolescents. Several intrapersonal factors such as various problem behaviours, low self-competency, and low self-esteem have also been found to be related to adolescent substance use. Taken together, the research conducted over the past 20 years has provided a greater understanding of the extent and nature of adolescent substance use and has been useful in developing effective prevention and treatment programs.

Unfortunately, relatively little drug survey research has been conducted in Alberta. In fact, Alberta is one of the few provinces where a large-scale survey has not been conducted. The most comprehensive study on drug use among Alberta adolescents is provided by a series of program evaluation surveys conducted by the Alberta Alcohol and Drug Abuse Commission (AADAC). Although the results are based on representative samples of the adolescent population, the size of the samples surveyed was smaller than those used in other provinces. Consequently, much less is known about the prevalence of substance use among Alberta adolescents and the factors that may place them at greater risk for use and abuse.

1.2 Objectives of the Study

AFLSAF awarded funding to CRILF to conduct a province-wide study of substance use among adolescents between the ages of 12 and 18 living in Alberta. Informed by a careful review of the current drug-use literature and consultation with experts in the field, a number of specific objectives and related research questions were identified and adopted to guide this research. The following is a list of the five major objectives addressed in this study:

(1) To investigate the prevalence and frequency of substance use among Alberta adolescents.

(2) To investigate the demographic factors associated with adolescent substance use.

(3) To investigate the relationship between family characteristics and adolescent substance use.

(4) To investigate the relationship between other interpersonal and school factors and adolescent substance use.

(5) To investigate the relationship between intrapersonal factors and adolescent substance use.

The primary goal of this study is to provide baseline data on the number of adolescents who are using cigarettes, alcohol, and other drugs in Alberta and to identify possible factors that may deter adolescents from experimenting with these substances. This report presents only preliminary findings with respect to these issues. Following a discussion of the methodology employed in this study, the results pertinent to each research objective will be presented.

2.0 Research Methodology

To reflect the urban/non-urban student population that is characteristic of Alberta, the cooperation and participation in the study of nine school districts within Alberta was obtained. These districts included: Calgary Board of Education, Calgary Catholic Board of Education, Edmonton Catholic Board of Education, Edmonton Public Schools, North Peace Roman Catholic Separate School District No. 43, Peace River School Division No. 10, Red Deer Catholic Board of Education, St. Paul County Schools, and St. Paul Education. The research design and instruments used in the present study were developed in consultation with an advisory committee struck at the outset of the project. This committee was composed of representatives from several groups including the participating school divisions, the Alberta Family Life and Substance Abuse Foundation, the Premier's Council in Support of Alberta Families, the Alberta Alcohol and Drug Abuse Commission, the Chedoke Child and Family Center, and the Canadian Research Institute for Law and the Family Board of Directors. The members of this committee also approved the final data collection procedures for the study prior to its implementation. The research design and procedures, sampling strategy, nature of the samples, research instruments, data analysis strategy, and limitations of the study are described below.

2.1 Research Design and Procedures

The adolescent questionnaire was constructed for school administration to junior and senior high students (12 through 18 years of age). In addition, to maximize the accuracy of the data concerning family characteristics and functioning, as well as to collect data regarding parents' substance use habits, a parent questionnaire was designed. Adolescent and parent respondents were anonymous and questionnaires could not be traced back to individuals.

Following identification of the students to be included in the study by the participating school districts (see discussion of sampling below), but prior to questionnaire administration, mailing labels containing their parents' name and address were prepared by each school district. Subsequently an "exclusion/consent" letter was mailed to each parent. This letter briefly described the study and indicated that the parents' child had been selected to participate in the study. The letter requested the participation of the parents and their child, and indicated that, if the parents consented to participate, a questionnaire would also be mailed to their home. If parents chose not to participate, they were requested to sign and date an attached form, and return it to CRILF in a prepaid enclosed envelope by a specified date. All families for which a signed form was returned, as well as those families whose letters were returned as undeliverable, were excluded from participation. The total sample size and total number of exclusions within each school district are presented in Table A-2.1, Appendix A. Response rates were as expected in a study of this type, and ranged from 64.9% to 88.7% within school districts.

A final list of participating students was compiled, and a convenient date and time for in-school administration of the adolescent questionnaire was determined with each school. The questionnaires were administered by trained members of the CRILF research team. As part of the introduction to the survey, students were informed that their participation was completely voluntary and, if they chose to participate, they could omit any questions on the questionnaire that they did not wish to answer. In-school surveys were conducted during the period April 26 to June 3, 1993.

Parent questionnaires were mailed to the parents of students who were selected to participate in the study and who had not previously been excluded. The mail-out used a procedure devised in consultation with the school districts that ensured that confidentiality of parents' names and addresses was maintained. The questionnaires sent to individual parents were mailed on the same day that their child was scheduled to complete their in-school questionnaire, thereby ensuring that no parent would receive a questionnaire prior to their child being surveyed. Parents were requested to mail the completed questionnaire to CRILF using an enclosed prepaid envelope.

2.2 Sampling Strategy

The present study utilized an individual random sampling procedure whereby junior and senior high schools were randomly selected within each school district. Individual students within these schools were then randomly selected to participate in the study. In addition, the random selection of students was conducted stratified by age from 12 through 18 years. This ensured that the proportion of students within each age group from the total population within each school district was reflected in the final sample. Individual school districts were responsible for drawing the sample of students based on a required sample size provided to them by CRILF. In the few cases where individual sampling was not possible, a classroom sampling method was adopted. In these cases, one or more classes that were mandatory for all students within individual schools were randomly selected for participation in the study, thereby enhancing the representativeness of the survey sample. We have no reason to believe that this minor deviation from the procedure led to any systematic bias in the final sample.

2.3 Nature of the Data Sets

The study resulted in three data sets: adolescent data, parent data, and a data set consisting of matched adolescent and parent data. Each of these data sets is described below.

Adolescent Data Set

Table A-2.1, Appendix A, also presents the number of valid adolescent questionnaires received within each school district with corresponding response rates. Out of 3,390 students in the original sample, 489 (14.4%) were excluded, resulting in a final sample of 2,901. Valid questionnaires were received from 2,118 students, which represents an overall response rate of

73% out of the total number of possible respondents. The response rates were similar across school districts, with most falling within the 70-80% range.

Demographic characteristics indicated that the distribution of gender was close to evenly split between males (51.5%) and females (48.5%), which reflects the distribution of gender in the Alberta student population for this age group. In addition, the distribution of age in the sample also approximates the age distribution in the student population. It should be noted that although our sampling frame included students from 12 through 18 years of age, the final sample included 34 students who were aged 19 to 21. These students were retained in the sample, and were combined into the "19+" age category. Two 11-year-old respondents were dropped from the sample.

Respondents from Calgary and Edmonton comprised 69.9% of the sample, while 30.1% of the sample was drawn from Red Deer, St. Paul, and Peace River.

Parent Data Set

Table A-2.2, Appendix A presents the total number of parent questionnaires mailed out within each school district, the number of valid questionnaires returned, and the corresponding response rates. A total of 1,388 valid parent questionnaires were received. The overall response rate for the parent sample was 47.8%, which would be expected for this type of mail-out survey.

Respondents were primarily married females in the 40 to 44 age group. In addition, the sample represents a group of generally well-educated individuals, with 32.2% of the sample having completed college or university. Also, the majority of the respondents (48.1%) were employed full-time. These characteristics are probably to be expected from the respondents to a mail-out survey such as this. The breakdown of respondents from urban and non-urban locales was quite similar to that obtained with the adolescent sample.

Matched Data Set

To allow for intra-familial analyses, adolescent and parent data were matched and combined into a single data set. Matching was accomplished by utilizing a three element code: the school attended by the adolescent, the adolescent's gender, and the adolescent's date of birth. School was precoded on both sets of questionnaires, while gender and date of birth were provided by both the adolescents and parents on their questionnaires. As indicated in Table A-2.3, Appendix A, successful matches were obtained for 985 questionnaires, which represents 71% of the 1,388 parent questionnaires available for matching. In all cases, the demographics of the matched data set were quite similar to those obtained within the individual adolescent and parent samples, which suggests that the respondents who were successfully matched are a representative sample of the total data sets.

2.4 Research Instruments

The initial stage of questionnaire construction began with a review of the current substance use literature. This review identified a number of important content areas relevant to an understanding of adolescent substance use. A preliminary list of content areas to be included in the adolescent and parent questionnaires was distributed to specialists in the field for review. In consultation with these individuals, the content areas were finalized for the adolescent and parent questionnaires. The questionnaires were then pretested with a small group of students and their parents in the Foothills School Division No. 38. Based on this pretest, minor modifications were made to the instruments.

The final draft of the adolescent questionnaire was composed of items that logically fit into four content areas that were consistent with the objectives of the study: (1) family background and demographic items; (2) questions concerning how adolescents feel about themselves and their achievements; (3) questions about their social life and school environment; and (4) questions about their experiences with cigarettes, alcohol and other drugs.[1] The majority of the questions were forced response, where students were asked to mark the answer that best describes them and/or their current situation.

The final draft of the parent questionnaire was similar to the adolescent form. In general, the content areas or sections were the same. In addition to supplementing and corroborating the information collected from the student, the parent questionnaire was designed to provide information not obtained from the adolescent form. Of particular importance was the inclusion of parental substance use items, where parents were asked to describe their own use patterns as well as those of their spouse/partner, where applicable.[2]

2.5 Data Analysis Strategy

The presentation of the results is organized around specific research questions, and each chapter presents the analyses pertinent to a major research objective. As noted above, three distinct data sets were generated in this study. For all analyses, the adolescent data set was considered the major source of information and thus was used wherever possible. In cases where the issue of interest could only be obtained from the parent questionnaires, the combined data set was utilized. In no case was the parent sample alone used for analysis purposes. The source of data for all analyses is indicated in the text of the results and accompanying tables. With the exception of Chapter 3.0 on the prevalence and frequency of substance use, use was defined as ever having used a particular substance (i.e., lifetime prevalence). Tables in Chapters 4.0

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[1]Certain items concerning sexual intercourse were not included in the questionnaire administered to students in the Edmonton and Calgary Catholic school systems.

[2]The parental drug involvement section of the parent questionnaire was excluded for the Edmonton Catholic school district mail-out.

through 7.0 include levels of statistical significance where appropriate. For the sake of brevity, statistical significance is not discussed in the text.

2.6 Limitations of the Study

Although every effort was made in this project to obtain a representative sample of Alberta adolescents and their parents, certain limitations that invariably apply to this type of research should be noted. As discussed above, wherever possible, individual students were selected at random for participation in the study. However, the possibility remains that through the two levels of exclusion (i.e., exclusion by returning of the exclusion/consent form and exclusion by not completing the questionnaire), respondents who completed the questionnaire represent a sample that is biased in some way from the population of Alberta adolescents and their parents. One obvious group that could not be captured in a school-based survey is school drop-outs. Since these students tend to be those at the highest risk of engaging in problem behaviour (Clayton & Voss, 1982), the net effect of any bias from this source in the present study would be an underestimation of substance use and other problem behaviours. However, as noted by Johnston and O'Malley (1985), this factor typically has only a small effect on estimates of the prevalence of substance use.

In addition, parents who respond to a mail-out survey such as this may tend to represent a distinct subset of the general population. However, in this case as well, one would expect that any biasing effect would be in the same direction as that of the adolescents, and would lead to lower estimates of problem behaviours and substance use than those levels present in the general population.

A final limitation of the present study that should be recognized is one inherent in all cross-sectional survey research. Because the instrument is administered to respondents only once at a single moment in time, it is difficult to make statements about cause and effect relationships between psychosocial characteristics and behaviours. This type of research design, while allowing us to examine relationships and associations among variables, does not afford the opportunity to conclude with certainty that changes in one characteristic cause changes in another.

3.0 Prevalence and Frequency of Substance Use

This chapter examines the prevalence of substance use and the frequency of use among a random sample of Alberta students. Respondents were asked to report on lifetime use, use in the past 12 months, and use in the past four weeks for a number of substances. This strategy for reporting use is commonly used in the research literature. Respondents were also asked about the frequency of their use of each substance. Frequency as it is reported here refers to how often, on average, adolescents used a particular substance in the 12 months preceding the survey.

Recent drug-use surveys conducted in Canada and the United States suggest that tobacco and alcohol are the most widely used substances among adolescents (Eliany, Wortley & Adlaf, 1992; Johnston, O'Malley & Bachman, 1991; National Institute on Drug Abuse, 1991). Previous research suggests that by their senior year in high school, the majority of young adults have used these substances at least once in their lifetime. Marijuana and hashish (cannabis) are typically found to be the most widely used illicit drugs, followed by hallucinogens and amphetamines/stimulants. Use of most other types of substances is relatively uncommon, with few adolescents reporting that they have ever experimented with other drugs. This pattern of consumption is reflected in the rates for annual and monthly use, where adolescents are more likely to report using alcohol, tobacco and marijuana than other types of substances.

Lifetime prevalence rates from the 1990 National Household Survey on Drug Abuse (National Institute on Drug Abuse, 1991) conducted in the United States show that 48.2% of youth aged 12 to 17 have used alcohol at least once in their lifetime, 40.2% have smoked cigarettes, 14.8% have used marijuana/hashish, 7.8% have used hallucinogens, and less than 5% have used one or more of the other drugs included in the survey. The percentages of youth in this US study who reported using a substance in the past year were as follows: alcohol (41%); cigarettes (22.2%); marijuana/hashish (11.3%); and other substances (less than 5%). Similarly, the percentages of youth reporting use in the month preceding the survey were highest for alcohol (24.5%) and cigarettes (11.6%), and much lower for all other substances with the highest reported use for marijuana (5.2%).

The results of the 1991 Ontario Student Drug Use Survey (Smart, Adlaf & Walsh, 1991) indicate that the three most commonly used substances (lifetime) among students in Grades 7, 9, 11, and 13 were alcohol (66.6%), followed by tobacco (32.4%), and cannabis or marijuana/hashish (16.2%). The lifetime prevalence rates for all other substances never exceeded 10% of the sample. The annual drug use estimates among these youth reveal a similar pattern, with the rates highest for alcohol (58.7%), followed by tobacco (21.7%), cannabis (11.7%), and much lower rates for all other drugs (rates never exceeded 6% of the sample).

The findings of the 1990 British Columbia Student Drug Use Survey (British Columbia Ministry of Health and Ministry Responsible for Seniors, 1992) also found that alcohol, tobacco, and marijuana/hashish are the most widely used substances by adolescents. For example, 72.3% of adolescents in the sample reported using alcohol in the 12 months preceding the survey, 26.8%

reported using tobacco, and 23.1% reported using cannabis. Once again, the percentages using other substances were relatively low with the exception of hallucinogens (10.4%).

Past studies which have examined the frequency of use follow a similar pattern whereby higher frequency rates for alcohol, cigarettes, and marijuana/hashish have been found. Overall, however, high frequency use of most other substances is relatively uncommon (National Institute on Drug Abuse, 1991; Smart, Adlaf & Walsh, 1991).

3.1 Prevalence

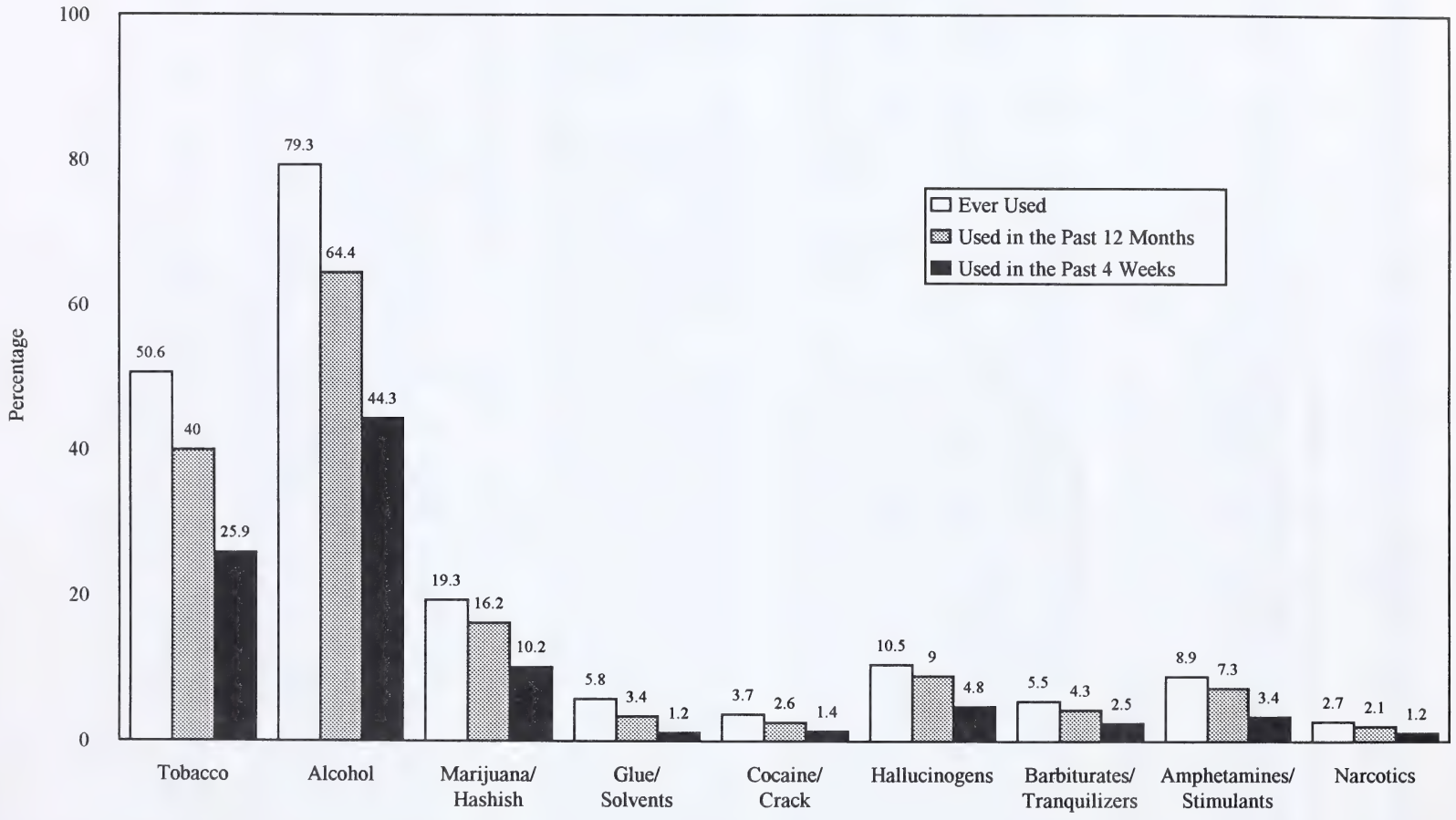
Figure 3.1 presents the lifetime, annual, and monthly prevalence of the use of nine substances by adolescents surveyed in the present study. These data are consistent with the findings of earlier drug-use surveys, and indicate that alcohol and tobacco are the most widely used substances among adolescents in this study. More than three-quarters of the adolescents (79.3%) indicated that they had tried alcohol at least once in their lifetime and approximately one-half (50.6%) of the respondents reported ever using tobacco. Similar to previous findings, the percentage of adolescents who reported lifetime use of the other substances was substantially lower than that of alcohol and tobacco. However, the rates of use were still relatively high with 19.3% reporting lifetime use of marijuana/hashish, 10.5% for hallucinogens, and 8.9% for amphetamines/stimulants. Lifetime use of all other substances ranged from a low of 2.7% for narcotics to a high of 5.8% for glue/solvents.

Consistent with the findings from other surveys, the consumption patterns of use in the 12 months and four weeks preceding the survey parallel consumption patterns of lifetime use. For example, the number of respondents who reported using tobacco, alcohol, and marijuana/hashish in the past 12 months and the past four weeks was higher than the number of respondents who indicated annual and monthly use of other substances. However, for all substances, more than 50% of adolescents who had ever used had also used it in the past year. In addition, for all substances, a substantial proportion of lifetime users had also used within the past four weeks.

The results of the present study, when compared with the findings of other drug-use surveys conducted in the United States and other Canadian provinces, suggest that Alberta adolescents are more likely to be using most substances. This is consistent with the research findings of the Alcohol and Other Drug Use Survey (1989), a nationally representative drug-use survey conducted in Canada, which found that the proportion of drinkers (lifetime users of alcohol) aged 15 to 24 was highest in the Prairie provinces (Alberta, Saskatchewan, and Manitoba; 87%) followed by British Columbia (86%), Quebec (83%), Ontario (78%), and the Atlantic provinces (75%). The Alcohol and Other Drug Use Survey also revealed that in addition to high alcohol consumption, the Prairie Provinces also have the highest percentage of lifetime smokers (49%). Similarly, youth living in the Prairie provinces are more likely to have used marijuana, cocaine/crack, and other drugs at least once in their lifetime than those youth living in most other parts of Canada.

FIGURE 3.1

PREVALENCE OF ADOLESCENT SUBSTANCE USE IN LIFETIME, PAST TWELVE MONTHS, AND PAST FOUR WEEKS



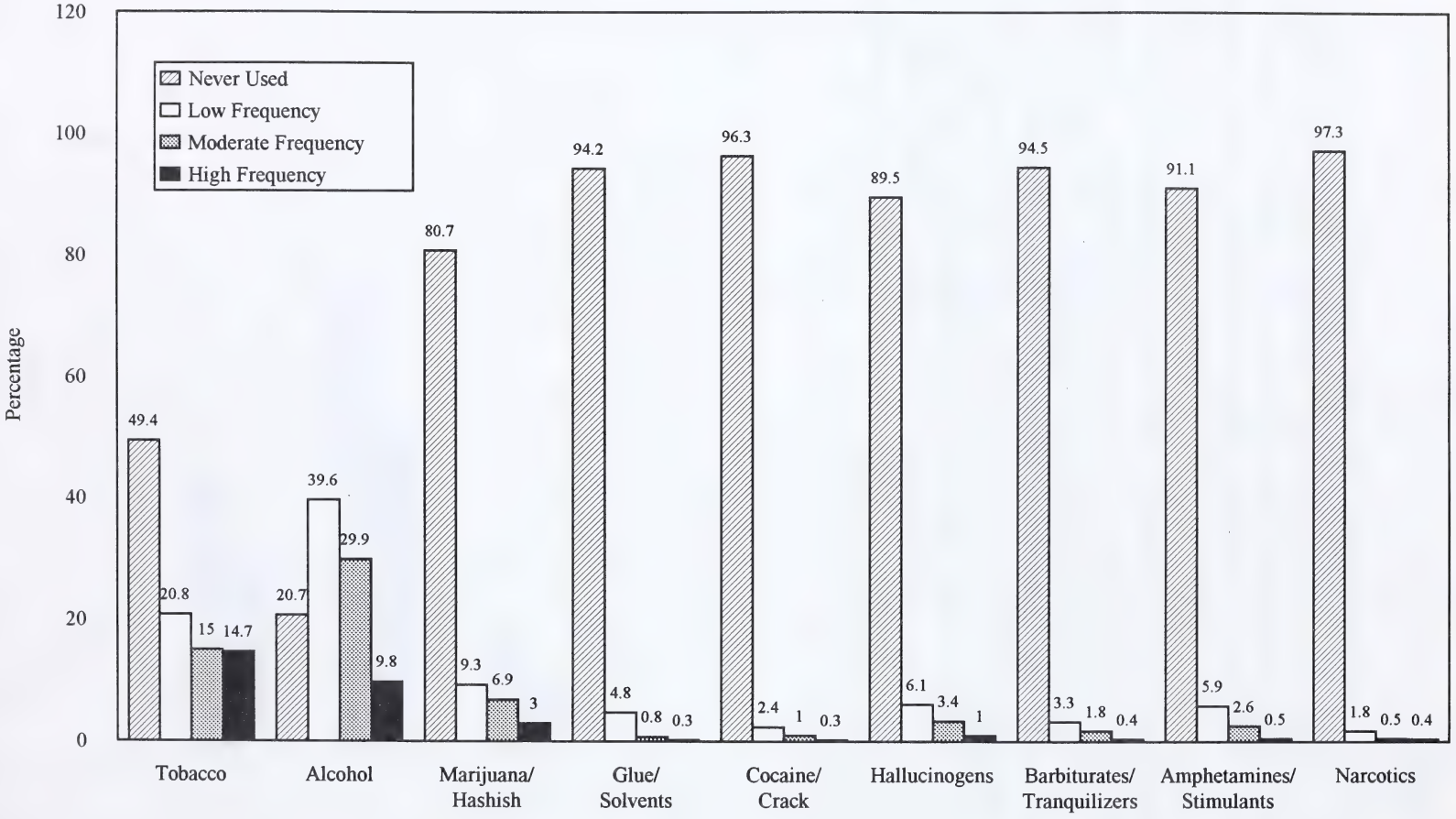
Source of Data: Adolescent Questionnaires
This figure is based on data contained in Table A-3.1, Appendix A.
Each percentage is based on N: 2,118.

3.2 Frequency

Lifetime users of each substance were also asked to indicate how often they had used that substance within the past 12 months. Based on their responses, students were classified as "Low Frequency Users," "Moderate Frequency Users," and "High Frequency Users." Criteria used to determine these frequencies are presented in Table A-3.2, Appendix A. Figure 3.2 presents the number and percentage of respondents falling into each category, along with those who had never used a particular substance. For each substance, the majority of lifetime users were likely to fall into the low frequency user group, indicating that, overall, the substance users in this sample were using relatively infrequently. However, it is interesting to note that almost 30% of respondents were using tobacco with a moderate or high frequency. The corresponding figures for alcohol and marijuana/hashish were 39.7% and 9.9%, indicating that, for these three substances, a substantial number of adolescents were engaging in relatively frequent use. The substances with the largest proportion of high frequency users were tobacco (14.7%), alcohol (9.8%), and marijuana/hashish (3%). When the percentage of high frequency users for each substance is calculated out of the total number of lifetime users for each substance, the data indicate that the tobacco using population has the highest proportion of high frequency users (29.1%), followed by marijuana/hashish (15.7%), narcotics (15.5%), alcohol (12.3%), hallucinogens (9.9%), cocaine/crack (8.9%), barbiturates/tranquilizers (6.8%), amphetamines/ stimulants (5.3%), and glue/solvents (4.9%).

FIGURE 3.2

FREQUENCY OF ADOLESCENT SUBSTANCE USE IN PAST TWELVE MONTHS



Source of Data: Adolescent Questionnaires
This figure is based on data contained in Table A-3.3, Appendix A. Criteria for classification of respondents into Low, Moderate, and High Frequency Users are presented in Table A-3.2, Appendix A.
N: 2,118

4.0 Demographic Factors Associated with Adolescent Substance Use

4.1 Adolescent Demographics

In order to assess the relationship between adolescent demographic factors and substance use, data were collected on four specific demographic characteristics: gender; age; religious affiliation; and geographical location (large urban/small urban-rural). Gender has been shown to be related to adolescent use of a variety of substances. Past research that has compared male and female students indicate that, in general, a higher proportion of males have tried using alcohol and other illicit drugs at least once in their lifetime than their female counterparts (Barnes & Welte, 1986a; Barnes & Welte, 1986b; Smart, Adlaf & Walsh, 1991). One exception to this pattern is found with tobacco, where more females than males now tend to smoke. For other substances, there is some evidence that the gender difference is diminishing (Johnston et al., 1991). Studies have also consistently found that the probability of drug use increases as a function of age during adolescence and young adulthood. In general, younger adolescents are less likely to report ever using tobacco, alcohol, and other drugs than older adolescents (Johnston et al., 1991; Kandel & Logan, 1984; National Institute on Drug Abuse, 1991; Smart et al., 1991). Religious affiliation has also been implicated in adolescent drug use. Adolescents who identify themselves as belonging to a particular denomination are less likely to report having used a substance in their lifetime than adolescents who report no religious affiliation (Acheampong & Bahr, 1986; Adlaf & Smart, 1985; Brownfield & Sorenson, 1991; Cochran, 1991). Finally, some studies have reported that there are differences in use according to population density, which is often measured by examining large urban centres and smaller, non-urban communities. In the past, higher lifetime rates have been reported for most drugs among adolescents living in urban versus non-urban settings, although recent research suggests that the differences are not as great as earlier studies (Farrell, Anchors, Danish & Howard, 1992; Johnston et al., 1991).

The relationship between these demographic characteristics and lifetime substance use in the present study is presented in Table 4.1. Consistent with previous research, more females (56%) reported that they had ever used tobacco than males (45.4%). One substance for which a significant gender difference was observed was amphetamines/stimulants, where females were twice as likely as males to be lifetime users (12.1% compared to 6%). One interpretation of this finding is that females may be more likely to use diet pills, which fall into this category of substances. For all other substances, males were somewhat more likely to be users than females.

Also consistent with earlier studies, lifetime use of substances tended to increase steadily with age. One notable exception to this pattern is for tobacco, where the highest proportion of lifetime users was found at age 16, and then declined at older ages.

TABLE 4.1

NUMBER OF ADOLESCENT RESPONDENTS EVER USING SUBSTANCES
BY ADOLESCENT DEMOGRAPHIC CHARACTERISTICS[1]

Demographic Characteristics	Tobacco		Alcohol		Marijuana/ Hashish		Glue/ Solvents		Cocaine/ Crack		Halluci- nogens		Barbiturates/ Tranquilizers		Amphetamines /Stimulants		Narcotics	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Gender[2]		***														***		
Male (n=1,087)	494	45.4	845	77.7	216	19.9	67	6.2	49	4.5	127	11.7	52	4.8	65	6.0	34	3.1
Female (n=1,025)	574	56.0	831	81.1	190	18.5	56	5.5	30	2.9	95	9.3	65	6.3	124	12.1	24	2.3
Age[3]		***		***								***		**		***		
12 (n=129)	30	23.3	77	59.7	4	3.1	5	3.9	1	0.8	3	2.3	1	0.8	2	1.6	0	0.0
13 (n=315)	136	43.2	206	65.4	23	7.3	20	6.3	6	1.9	11	3.5	8	2.5	13	4.1	4	1.3
14 (n=405)	197	48.6	318	78.5	54	13.3	28	6.9	17	4.2	31	7.7	27	6.7	33	8.1	12	3.0
15 (n=433)	236	54.5	352	81.3	90	20.8	31	7.2	17	3.9	54	12.5	25	5.8	41	9.5	13	3.0
16 (n=369)	214	58.0	320	86.7	98	26.6	23	6.2	14	3.8	45	12.2	25	6.8	42	11.4	13	3.5
17 (n=291)	162	55.7	252	86.6	74	25.4	10	3.4	15	5.2	41	14.1	19	6.5	40	13.7	11	3.8
18 (n=133)	74	55.6	120	90.2	49	36.8	6	4.5	6	4.5	27	20.3	7	5.3	13	9.8	2	1.5
19+ (n=34)	17	50.0	30	88.2	14	41.2	0	0.0	3	8.8	10	29.4	5	14.7	5	14.7	3	8.8
Religion[4]		***		***		**						**				**		
Catholic (n=885)	478	54.0	740	83.6	167	18.9	48	5.4	26	2.9	88	9.9	44	5.0	69	7.8	18	2.0
Protestant (n=394)	206	52.3	316	80.2	75	19.0	25	6.3	13	3.3	40	10.2	26	6.6	51	12.9	11	2.8
Other (n=313)[5]	112	35.8	189	60.4	41	13.1	17	5.4	13	4.2	20	6.4	14	4.5	17	5.4	7	2.2
None (n=526)	275	52.3	434	82.5	125	23.8	33	6.3	27	5.1	74	14.1	33	6.3	52	9.9	22	4.2
Location[6]				***												*		
Large Urban (n=1,481)	731	49.4	1,126	76.0	284	19.2	94	6.3	61	4.1	162	10.9	79	5.3	119	8.0	41	2.8
Small Urban/Rural (n=637)	340	53.4	553	86.8	124	19.5	29	4.6	18	2.8	60	9.4	38	6.0	70	11.0	17	2.7

[1]Source of Data: Adolescent Questionnaires

[2]Missing Observations: 6; Total N: 2,112

[3]Missing Observations: 9; Total N: 2,109

[4]"None" includes missing data (n=66); Total N: 2,118

[5]"Other" includes religions such as Buddhism, Hinduism, Judaism, Mormon, and Islam.

[6]Total N: 2,118; "Large Urban" location includes school districts in Calgary and Edmonton; "Small Urban/Rural" location includes school districts in Red Deer, St. Paul, and Peace River.

*** $p < .001$; ** $p < .01$; * $p < .05$

The findings with respect to religious affiliation were mixed and, for the most part, were not consistent with earlier studies. For most substances, students who reported no religious affiliation were only slightly more likely to report lifetime use than those who reported a religious affiliation and, in fact, for some substances such as tobacco and alcohol, students with no religious affiliation were less likely to report lifetime use. An interesting finding is that, for most substances, respondents falling into the "Other" category were least likely to report lifetime use. This result probably reflects the fact that this category includes students belonging to religions which specifically prohibit the use of substances, such as those reporting to be Mormon or Muslim.

Finally, when lifetime substance use rates are examined by large urban versus small urban/rural locations, the data indicate that use of tobacco and amphetamines/stimulants, and particularly alcohol, is substantially higher in small urban/rural locations. The use of other substances, however, is more common in large urban locations. These findings are, for the most part, consistent with earlier research.

4.2 Family Demographics

In addition to the demographic characteristics of the adolescent respondents, a number of family background variables have been linked to teenage drug use and abuse. For example, living with a single parent in a low socioeconomic status family appears to increase the likelihood that an adolescent will use a variety of substances (Grady, Gersick, Snow & Kessen, 1986; Jurich, Polson, Jurich & Bates, 1985; Selnow, 1987). Similarly, the religious beliefs of the parent(s) have also been implicated in some studies as a factor in adolescent use of substances. Some studies have also reported that youth who grow up in homes where the parents have no religious affiliation or involvement are more likely to be using alcohol and other drugs (Coombs, Wellisch & Fawzy, 1985). It is important to note, however, that unlike the relationship between adolescent demographic factors and substance use, the association between family demographics and substance use has not been consistently demonstrated (Coombs & Paulson, 1988).

Family demographic information was collected through both the adolescent and parent questionnaires. The adolescent questionnaire provided data on family type, while the parent questionnaire yielded information on total family income as an index of socioeconomic status and on the parent(s)' religion. The relationship between these family demographic factors and adolescent substance use is presented in Table 4.2. In terms of family type, results indicated that, for all substances except alcohol, adolescents who lived with both parents were least likely to report lifetime use. In contrast, for most substances, students who lived in single parent homes or in reconstituted families were most likely to report lifetime use.

TABLE 4.2

NUMBER OF ADOLESCENT RESPONDENTS EVER USING SUBSTANCES BY FAMILY DEMOGRAPHIC CHARACTERISTICS

Family Demographics	Tobacco		Alcohol		Marijuana/ Hashish		Glue/ Solvents		Cocaine/ Crack		Hallucin- ogens		Barbiturates/ Tranquilizers		Amphetamines /Stimulants		Narcotics	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Family Type[1]	***				***		*		***		***				**			
Both Parents (n=1,344)	631	46.9	1,060	78.9	195	14.5	65	4.8	28	2.1	104	7.7	63	4.7	100	7.4	30	2.2
Single Parent (n=253)	162	64.0	209	82.6	81	32.0	17	6.7	16	6.3	43	17.0	20	7.9	22	8.7	6	2.4
Reconstituted Family (n=156)	98	62.8	131	84.0	47	30.1	9	5.8	13	8.3	24	15.4	9	5.8	23	14.7	6	3.8
Other (n=310)[2]	146	47.1	237	76.5	68	21.9	28	9.0	18	5.8	46	14.8	23	7.4	39	12.6	14	4.5
Family Income[3]									**								**	
< $10,000 (n=14)	3	21.4	9	64.3	0	0.0	1	7.1	0	0.0	0	0.0	1	7.1	0	0.0	0	0.0
$10,000 - 19,000 (n=46)	18	39.1	33	71.7	9	19.6	1	2.2	5	10.9	8	17.4	4	8.7	6	13.0	5	10.9
$20,000 - 29,000 (n=81)	38	46.9	61	75.3	11	13.6	3	3.7	0	0.0	5	6.2	3	3.7	4	4.9	1	1.2
$30,000 - 39,000 (n=100)	54	54.0	87	87.0	22	22.0	4	4.0	4	4.0	9	9.0	7	7.0	6	6.0	0	0.0
$40,000 - 49,000 (n=119)	55	46.2	99	83.2	16	13.4	7	5.9	3	2.5	8	6.7	8	6.7	9	7.6	1	0.8
$50,000 - 59,000 (n=133)	60	45.1	105	78.9	16	12.0	8	6.0	5	3.8	9	6.8	6	4.5	8	6.0	4	3.0
$60,000 - 69,000 (n=126)	63	50.0	99	78.6	23	18.3	10	7.9	1	0.8	9	7.1	8	6.3	11	8.7	4	3.2
$70,000 - 79,000 (n=93)	39	41.9	68	73.1	12	12.9	1	1.1	1	1.1	9	9.7	5	5.4	8	8.6	0	0.0
> $80,000 (n=221)	120	54.3	182	82.4	40	18.1	14	6.3	4	1.8	24	10.9	8	3.6	16	7.2	5	2.3
Parent's Religion[4]	***		***		*													
Catholic (n=380)	199	52.4	325	85.5	64	16.8	24	6.3	14	3.7	38	10.0	24	6.3	29	7.6	11	2.9
Protestant (n=425)	215	50.6	331	77.9	70	16.5	21	4.9	8	1.9	34	8.0	20	4.7	33	7.8	10	2.4
Other (n=90)[5]	24	26.7	55	61.1	4	4.4	2	2.2	1	1.1	3	3.3	3	3.3	3	3.3	0	0.0
None (n=90)	36	40.0	73	81.1	17	18.9	3	3.3	0	0.0	9	10.0	4	4.4	6	6.7	0	0.0

[1]Source of Data: Adolescent Questionnaires; Missing Observations: 55: Total N: 2,063

[2]Examples of "Other" family types include single parent and grandparent or other relative, and single parent and non-relative.

[3]Source of Data: Adolescent and Parent Matched Questionnaires; Missing Observations: 52; Total N: 933

[4]Source of Data: Adolescent and Parent Matched Questionnaires; "None" includes Missing Observations (n=7); Total N: 985

[5]"Other" includes religions such as Buddhism, Hinduism, Judaism, Mormon, and Islam.

*** $p < .001$; ** $p < .01$; * $p < .05$

The findings concerning the relationship between family income and substance use among adolescents were mixed and suggested that for tobacco, alcohol, marijuana/hashish, and glue/solvents there was no clear pattern between income level and lifetime use. However, consistent with previous research, the results indicated that students from lower income homes were more likely to report lifetime use for all other illicit substances, particularly cocaine/crack and narcotics, although the number of users was very small.

The relationship between parent(s)' religious affiliation and adolescent substance use was similar to that obtained with the adolescents' religious affiliation, and indicated that, for most substances, the children of parents classified into the "Other" category were least likely to report lifetime use of substances. Once again, this pattern is probably attributable to the presence in the "Other" category of religions where substance use is prohibited. No consistent pattern of results was observed between the lifetime use of children whose parent(s) reported no religious affiliation, and those who reported religious affiliation.

5.0 Family Factors Associated with Adolescent Substance Use

It has long been recognized that the family plays an important role in determining substance use and abuse among children and adolescents. Parents or parental figures appear to have direct and indirect influences on their children in several ways. Parental usage of legal and illegal substances (i.e., modelling) has been associated with adolescent use of tobacco, alcohol, and drugs (Hawkins, Lishner, Catalano & Howard, 1985; Kandel, Kessler & Margulies, 1978; Hundleby & Mercer, 1987; Andrews, Hops, Ary, Lichtenstein & Tildesley, 1991; Barnea, Teichman & Rahav, 1992). Similarly, poor family environment has been consistently linked with the teenage substance user. Adolescents living in families characterized by poor family management styles, conflictual parent-child relationships, little perceived closeness between parent and child, inadequate communication, a lack of family harmony and cohesiveness, low levels of parental support, and inconsistent discipline practices typically report greater substance use (Andrews et al., 1991; Barnea et al., 1992; Bloch, Crockett & Vicary, 1991; Coombs, Paulsen & Richardson, 1991; Donnermeyer & Huang, 1991; Hawkins et al., 1985; Hundleby & Mercer, 1987; Jessor & Jessor, 1977; Johnson & Pandina, 1991; Kandel, 1985; Kafka & London, 1991; Mercer, Hundleby & Carpenter, 1978; Swaim, 1991). In addition, the degree of parental monitoring or supervision and the level of involvement between parent and child also appear to be associated with adolescent drug use, where greater parental monitoring and more parental involvement decrease the chances that an adolescent will use drugs (Dielman, Butchart, Shope & Miller, 1990-91; Dishion & Loeber, 1985; Jessor & Jessor, 1977).

To examine the relationship between these family dimensions and drug use, adolescents in this study were asked about their perceptions of their family environment, the degree of monitoring exercised by their parent(s), and the level of parental involvement in their activities. In addition, the parent questionnaire asked respondents about their own experience with tobacco, alcohol, marijuana/hashish, and other drugs. Information pertaining to both the respondent and his or her spouse (where applicable) were collected.

To measure the adolescents' perceptions of their family environment, the General Functioning Subscale of the McMaster Family Assessment Device (Epstein, Baldwin & Bishop, 1983) was adopted to assess the overall functioning of the family. The General Functioning Subscale has been used in other studies to provide a general measure of the health/pathology of families with respect to parenting styles, communication patterns, parental affection, and cohesiveness. An additional scale was developed for purposes of this study to investigate the effect of the more positive dimensions of the family environment such as trust, respect, and parental support on substance use.

To investigate the association between parental monitoring and substance use, adolescents were asked to complete a number of questions about the extent to which their parent(s) monitored their day-to-day activities in such areas as limiting the amount of television watched and helping with homework. The responses to these questions were summed to yield a score for parental monitoring.

Adolescents also completed a leisure and recreation activity checklist that asked them to indicate the activities they engaged in at least once per week, and with whom. The number of activities engaged in with their parent(s) were summed to yield an overall index of parental involvement in the adolescents' activities.

5.1 Parental Substance Use

Because parents were asked to describe the substance use of both themselves and their spouse, where applicable, a single index was derived that indicated whether the child lived with at least one parent who had used each substance within the past 12 months. Table 5.1 presents the number of adolescents reporting lifetime use of each substance by whether they lived with at least one parent who had used tobacco, alcohol, marijuana/hashish, or other drugs in the past 12 months. For all substances, there was a clear tendency for adolescents to report lifetime use if they have lived with a parent who used any substance. These results provide support for the theory that parental modelling of substance use may be an important contributing factor to substance use among the adolescents in this study.

Tobacco use by parents was consistently related to substance use by adolescents and, in fact, for each substance, adolescents who lived with a smoking parent were more likely to report lifetime use. In addition, parental use of alcohol was strongly associated with adolescent use of both tobacco and alcohol. This pattern was most significant for families that included parents who used tobacco. For example, 25.3% of children whose parent(s) had not drank within the past 12 months reported the use of tobacco, compared to 50.8% of children whose parent(s) had drank within the past 12 months. Similarly, only 45.6% of students whose parent(s) had not drank in the past 12 months had consumed alcohol themselves, compared to 83.5% of children whose parent(s) had drank. Finally, parent(s) use of marijuana/hashish and other drugs was most strongly related to their children's use of marijuana/hashish and hallucinogens.

TABLE 5.1

NUMBER OF ADOLESCENT RESPONDENTS EVER USING SUBSTANCES BY PARENT USER/NON-USER OF SUBSTANCES IN THE HOME IN THE PAST 12 MONTHS[1]

Parent Substance User(s) (past 12 months) in the Home[2]	Tobacco		Alcohol		Marijuana/ Hashish		Glue/ Solvents		Cocaine/ Crack		Halluci- nogens		Barbiturates/ Tranquilizers		Amphetamines /Stimulants		Narcotics	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Tobacco	***		***		***				***		***		**		***		**	
Yes (n=402)	223	55.5	344	85.6	92	22.9	25	6.2	16	4.0	48	11.9	27	6.7	42	10.4	15	3.7
No (n=458)	194	42.4	344	75.1	39	8.5	18	3.9	3	0.7	20	4.4	12	2.6	19	4.1	4	0.9
Alcohol	***		***															
Yes (n=781)	397	50.8	652	83.5	123	15.7	38	4.9	19	2.4	62	7.9	37	4.7	56	7.2	18	2.3
No (n=79)	20	25.3	36	45.6	8	10.1	5	6.3	0	0.0	6	7.6	2	2.5	5	6.3	1	1.3
Marijuana/Hashish											*							
Yes (n=39)	23	59.0	31	79.5	10	25.6	4	10.3	2	5.1	7	17.9	2	5.1	3	7.7	1	2.6
No (n=821)	394	48.0	657	80.0	121	14.7	39	4.8	17	2.1	61	7.4	37	4.5	58	7.1	18	2.2
Other Drugs	*				***						**							
Yes (n=36)	25	69.4	32	88.9	14	38.9	2	5.6	1	2.8	7	19.7	3	8.3	2	5.6	1	2.8
No (n=824)	392	47.6	656	79.6	117	14.2	41	5.0	18	2.2	61	7.4	36	4.4	59	7.2	18	2.2

[1]Source of Data: Adolescent and Parent Matched Questionnaires
Respondents from Edmonton Catholic School District have been excluded.
Total N: 860

[2]"Parent" may include mother, father, or parent figure.

*** $p < .001$; ** $p < .01$; * $p < .05$

5.2 Family Characteristics

Table 5.2 presents information on the adolescents reporting lifetime use of each substance by scores on the four family characteristics scales discussed above. For the Family Functioning Subscale, adolescents who reported lower levels of functioning were substantially more likely to have tried any of the substances than those who reported higher levels of functioning. For the three most commonly used substances (i.e., tobacco, alcohol, and marijuana/hashish), results indicated that 75.7%, 92.4%, and 39.5% of adolescents from low functioning families had used tobacco, alcohol, and marijuana/hashish, respectively, compared with 44.7%, 71.7%, and 13.7% of students from high functioning families. These dramatic differences were also observed with less commonly used substances. For example, 24.3% and 9.2% of adolescents from low functioning families had used amphetamines/stimulants and narcotics, respectively, while 4.9% and 1.3% of students from high functioning families reported lifetime use of these drugs.

A similar pattern was found for the relationship between the Family Environment scale (which included trust, respect, and parental support) and adolescents' substance use. For all substances, students who indicated that their family environment was positive were substantially more likely to not report lifetime use. For example, 44% and 15.4% of adolescents who reported a positive family environment had used tobacco and marijuana/hashish, respectively, compared with the significantly high rates of 73.2% and 36.8% for children reporting a negative family environment.

The extent to which parents monitor and control their child's behaviour, as indicated by the Parental Monitoring scale, also exhibited a strong relationship to adolescents' use of substances. For example, of the students who reported a high level of parental monitoring, 41.2% had used tobacco, 69.6% had used alcohol, and 7.6% had used marijuana/hashish. In comparison, of students who reported a low level of parental monitoring, 69.4%, 89.2%, and 40.5% had used tobacco, alcohol, and marijuana/hashish, respectively. This pattern was also obtained for less commonly used substances. For example, 5.2% of adolescents who reported high monitoring had ever used hallucinogens, compared to 24.3% of children from low monitoring families.

Finally, students' responses to the Parental Involvement scale, which measured the number of activities engaged in by parents and their children together, were also strongly related to substance non-use. For example, of those students who reported a high level of parental involvement, 39.8% had used tobacco, 69% had used alcohol, 9.5% had used marijuana/ hashish, and 4.4% had used hallucinogens. In contrast, for students from low parental involvement families, the findings were much higher with 66.7% for tobacco, 86.8% for alcohol, 40.3% for marijuana/hashish, and 25.7% for hallucinogens.

Taken together, the results obtained with each of these scales are quite similar to those reported in earlier research, and clearly indicate that the quality and nature of family relationships are strongly related to children's use of substances. For all substances, adolescents who report negative family characteristics, whether these are defined in terms of low family functioning, a negative family environment, low parental monitoring, or low parental involvement, are more likely to report lifetime use of substances.

TABLE 5.2

NUMBER OF ADOLESCENT RESPONDENTS EVER USING SUBSTANCES BY FAMILY CHARACTERISTICS[1]

Family Characteristics	Tobacco		Alcohol		Marijuana/ Hashish		Glue/ Solvents		Cocaine/ Crack		Hallucin-ogens		Barbiturates/ Tranquilizers		Amphetamines/ Stimulants		Narcotics	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Family Functioning	***		***		***		***		***		***		***		***		***	
Low (n=185)	140	75.7	171	92.4	73	39.5	24	13.0	18	9.7	43	23.2	31	16.8	45	24.3	17	9.2
Moderate (n=1,707)	830	48.6	1,346	78.9	304	17.8	92	5.4	57	3.3	158	9.3	77	4.5	133	7.8	38	2.2
High (n=226)	101	44.7	162	71.7	31	13.7	7	3.1	4	1.8	21	9.3	9	4.0	11	4.9	3	1.3
Family Environment	***		***		***		***		***		***		***		***		***	
Negative (n=231)	169	73.2	203	87.9	85	36.8	30	13.0	25	10.8	47	20.3	32	13.9	45	19.5	15	6.5
Neutral (n=1,712)	825	48.2	1,347	78.7	296	17.3	87	5.1	50	2.9	161	9.4	78	4.6	135	7.9	38	2.2
Positive (n=175)	77	44.0	129	73.7	27	15.4	6	3.4	4	2.3	14	8.0	7	4.0	9	5.1	5	2.9
Parental Monitoring	***		***		***				***		***		***		***		***	
Low (n=222)	154	69.4	198	89.2	90	40.5	20	9.0	26	11.7	54	24.3	26	11.7	47	21.2	15	6.8
Moderate (n=1,515)	760	50.2	1,216	80.3	289	19.1	82	5.4	46	3.0	148	9.8	80	5.3	127	8.4	37	2.4
High (n=381)	157	41.2	265	69.6	29	7.6	21	5.5	7	1.8	20	5.2	11	2.9	15	3.9	6	1.6
Parental Involvement	***		***		***		***		***		***		***		***		*	
Low (n=144)	96	66.7	125	86.8	58	40.3	21	14.6	17	11.8	37	25.7	23	16.0	26	18.1	9	6.3
Moderate (n=1,700)	866	50.9	1,365	80.3	324	19.1	89	5.2	58	3.4	173	10.2	88	5.2	149	8.8	43	2.5
High (n=274)	109	39.8	189	69.0	26	9.5	13	4.7	4	1.5	12	4.4	6	2.2	14	5.1	6	2.2

[1]Source of Data: Adolescent Questionnaires; Total N: 2,118

*** $p < .001$; ** $p < .01$; * $p < .05$

6.0 Interpersonal and School Factors Associated with Adolescent Substance Use

A number of social environmental factors appear to be significantly related to an adolescent's decision to use or not use a variety of drugs. For example, peer factors have been shown to be a strong predictor of adolescent substance use. The association with drug-using peers has consistently been identified as one of the most predictive risk factors for drug use (Fors & Rojek, 1983; Kovach & Glickman, 1986; Marcos, Bahr & Johnson, 1986; Oetting & Beauvais, 1987). Adolescents who report that a significant number of their friends are using one or more substances are more likely to report using one or more substances themselves. The degree of perceived peer pressure to use drugs and their friends' general attitudes towards using drugs have also been shown to be influential in adolescent drug use (Hawkins et al., 1985; Pruitt, Kingery, Mirzaee, Heuberger & Hurley, 1991; Swaim, 1991).

School-related variables also appear to be significantly correlated with adolescent substance use. Typically, those adolescents who are experiencing problems at school (i.e., achieve lower grade point averages, skip classes and are at risk for dropping out of school) are at greater risk for using tobacco, alcohol, and other drugs (Allison & Dignam, 1990; Coombs et al., 1985; Kovach & Glickman, 1986; Pendorf, 1992; Swaim, 1991). The overall school climate, as perceived by the adolescent, is also a factor in adolescent drug-using behaviour. Positive school climates (i.e., those characterized by a strong commitment to the school, a nonconflictual teacher/student atmosphere, an emphasis on student achievement, and a high level of extracurricular involvement) have been associated with lower use of drugs by adolescents (Brook, Nomura & Cohen, 1989; Dielman et al., 1990-91; Hawkins et al., 1985).

Finally, there are some indications that involvement in extracurricular activities may be related to substance use among teenagers. It appears that adolescents who are involved in extracurricular activities (particularly organized sports, hobbies, and club activities that are supervised by an adult, or involve taking lessons) are generally less likely to be using and abusing most substances (Aguilar & Munson, 1992; Bechtel & Swisher, 1992; Hillman & Sawilowsky, 1991; Thorlindsson & Vilhjalmsson, 1991). Information related to each of these areas was collected in the present study.

6.1 Influence of Peers

The adolescent respondents were asked to indicate how many of their friends used tobacco, alcohol, marijuana/hashish, glue/solvents, cocaine/crack, and other drugs. Table 6.1 presents the number of adolescents using each substance by the prevalence of substance use among their peers. The pattern that emerged was quite similar to, but even stronger than, that observed with parental substance use, and indicated that adolescents who reported that most of their friends used drugs were also most likely to report lifetime use as well. In all cases, this finding was most dramatic when the same substance was examined for both respondents and their peers. For example, 84.9% of adolescents who indicated that most of their friends used tobacco also reported lifetime use of tobacco themselves, compared to only 17.6% of adolescents who reported that none of their friends use tobacco. Similarly, 94.6% of students who indicated that most of their peers drank alcohol were also lifetime drinkers, in contrast to only 47.3% of students who reported that none of their friends drank alcohol. For marijuana/hashish, glue/solvents, and cocaine/crack, 83.3%, 68.2%, and 56.5% of the respondents who indicated that most of their friends used these substances had also used these substances themselves. In contrast, 3.1%, 3.3%, and 1.4% of respondents who indicated that none of their friends used marijuana/hashish, glue/solvents, and cocaine/crack, respectively, had never used these substances themselves.

Although these effects were strongest when the same substances were compared for both respondents and their peers, it is interesting to note that similar effects were observed across substances. Thus, the use of any substance by most of a student's peer group is likely to affect the respondent's use of any substance. For example, 33.3% of respondents who reported that most of their friends used marijuana/hashish had used amphetamines/stimulants, in comparison to only 3.1% of respondents who indicated that none of their friends had used marijuana/hashish.

Respondents were also asked to indicate the degree of pressure they experienced from their peers to use the same drugs. The frequency of adolescent lifetime substance use by degree of peer pressure is presented in Table 6.2. For the most part, these data reveal a similar pattern to that discussed above dealing with peer substance use, although the differences in substance use between students experiencing a great deal of pressure and those who experience no pressure are not as great. For example, 71.8% of adolescents who indicated that they experience a lot of pressure to use tobacco had smoked in their lifetime, whereas only 46.1% of adolescents who reported no peer pressure had ever smoked. An interesting pattern that emerged with some substances was that respondents who reported experiencing some peer pressure to use a particular substance were more likely to report substance use than those who reported experiencing a lot of pressure. It is unclear what accounts for this difference; however, it is important to note that in all cases, respondents who reported no peer pressure were less likely to use substances than those who reported either some or a lot of pressure. Thus, it may be that simply the presence or absence of any peer pressure is the important factor related to adolescent substance use, rather than the degree of pressure experienced.

TABLE 6.1

NUMBER OF ADOLESCENT RESPONDENTS EVER USING SUBSTANCES BY SUBSTANCE USE AMONG PEERS[1]

Peer Substance Use	Tobacco		Alcohol		Marijuana/ Hashish		Glue/ Solvents		Cocaine/ Crack		Halluci- nogens		Barbiturates/ Tranquilizers		Amphetamines /Stimulants		Narcotics	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Tobacco	***		***		***		***		***		***		***		***		***	
Most (n=555)	471	84.9	521	93.9	276	49.7	73	13.2	63	11.4	163	29.4	74	13.3	113	20.4	43	7.7
A Few (n=1,080)	515	47.7	896	83.0	121	11.2	41	3.8	12	1.1	52	4.8	34	3.1	67	6.2	11	1.0
None (n=483)	85	17.6	262	54.2	11	2.3	9	1.9	4	0.8	7	1.4	9	1.9	9	1.9	4	0.8
Alcohol	***		***		***		***		***		***		***		***		***	
Most (n=810)	578	71.4	766	94.6	316	39.0	67	8.3	67	8.3	178	22.0	91	11.2	144	17.8	45	5.6
A Few (n=870)	413	47.5	706	81.1	84	9.7	48	5.5	10	1.1	39	4.5	22	2.5	40	4.6	11	1.3
None (n=438)	80	18.3	207	47.3	8	1.8	8	1.8	2	0.5	5	1.1	4	0.9	5	1.1	2	0.5
Marijuana/Hashish	***		***		***		***		***		***		***		***		***	
Most (n=168)	150	89.3	159	94.6	140	83.3	37	22.0	45	26.8	100	59.5	49	29.2	56	33.3	24	14.3
A Few (n=610)	453	74.3	571	93.6	227	37.2	45	7.4	24	3.9	98	16.1	45	7.4	92	15.1	22	3.6
None (n=1,340)	468	34.9	949	70.8	41	3.1	41	3.1	10	0.7	24	1.8	23	1.7	41	3.1	12	0.9
Glue/Solvents	***				***		***		***		***		***		***		***	
Most (n=22)	17	77.3	19	86.4	11	50.0	15	68.2	9	40.9	12	54.5	11	50.0	9	40.9	8	36.4
A Few (n=148)	93	62.8	121	81.8	39	26.4	43	29.1	15	10.1	23	15.5	18	12.2	25	16.9	13	8.8
None (n=1,948)	961	49.3	1,539	79.0	358	18.4	65	3.3	55	2.8	187	9.6	88	4.5	155	8.0	37	1.9
Cocaine/Crack	***		***		***		***		***		***		***		***		***	
Most (n=23)	17	73.9	19	82.6	13	56.5	9	39.1	13	56.5	12	52.2	11	47.8	10	43.5	11	47.8
A Few (n=250)	193	77.2	227	90.8	103	41.2	36	14.4	40	16.0	65	26.0	34	13.6	51	20.4	20	8.0
None (n=1,845)	861	46.7	1,433	77.7	292	15.8	78	4.2	26	1.4	145	7.9	72	3.9	128	6.9	27	1.5
Other Drugs	***		***		***		***		***		***		***				***	
Most (n=79)	67	84.8	73	92.4	56	70.9	17	21.5	21	26.6	45	57.0	24	30.4	25	31.6	18	22.8
A Few (n=521)	394	75.6	482	92.5	205	39.3	56	10.7	39	7.5	120	23.0	55	10.6	100	19.2	28	5.4
None (n=1,518)	610	40.2	1,124	74.0	147	9.7	50	3.3	19	1.3	57	3.8	38	2.5	64	4.2	12	0.8

[1]Source of Data: Adolescent Questionnaires; Total N: 2,118

*** $p < .001$; ** $p < .01$; * $p < .05$

TABLE 6.2

NUMBER OF ADOLESCENT RESPONDENTS EVER USING SUBSTANCES BY PERCEIVED PRESSURE FROM PEERS TO USE SUBSTANCES[1]

Degree of Pressure to Use Substances	Tobacco		Alcohol		Marijuana/ Hashish		Glue/ Solvents		Cocaine/ Crack		Halluci- nogens		Barbiturates/ Tranquilizers		Amphetamines /Stimulants		Narcotics	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Tobacco	***		**		***		***		***		***		***		***		***	
A Lot (n=78)	56	71.8	66	84.6	28	35.9	16	20.5	15	19.2	19	24.4	15	19.2	20	25.6	8	10.3
Some (n=381)	251	65.9	322	84.5	74	19.4	32	8.4	15	3.9	38	10.0	25	6.6	40	10.5	15	3.9
None (n=1,659)	764	46.1	1,291	77.8	306	18.4	75	4.5	49	3.0	165	9.9	77	4.6	129	7.8	35	2.1
Alcohol	***		***				***		***		*		**		***		***	
A Lot (n=124)	78	62.9	107	86.3	30	24.2	17	13.7	15	12.1	21	16.9	15	12.1	21	16.9	14	11.3
Some (n=589)	346	58.7	527	89.5	114	19.4	38	6.5	21	3.6	56	9.5	36	6.1	64	10.9	13	2.2
None (n=1,405)	647	46.0	1,045	74.4	264	18.8	68	4.8	43	3.1	145	10.3	66	4.7	104	7.4	31	2.2
Marijuana/Hashish	***		***		***		***		***		***		***		***		***	
A Lot (n=49)	33	67.3	41	83.7	25	51.0	9	18.4	13	26.5	17	34.7	10	20.4	15	30.6	7	14.3
Some (n=161)	132	82.0	153	95.0	90	55.9	24	14.9	17	10.6	54	33.5	23	14.3	39	24.2	15	9.3
None (n=1,908)	906	47.5	1,485	77.8	293	15.4	90	4.7	49	2.6	151	7.9	84	4.4	135	7.1	36	1.9
Glue/Solvents							***		***				***		*		***	
A Lot (n=30)	16	53.3	21	70.0	7	23.3	8	26.7	5	16.7	7	23.3	6	20.0	5	16.7	5	16.7
Some (n=33)	19	57.6	26	78.8	11	33.3	10	30.3	3	9.1	4	12.1	4	12.1	7	21.2	4	12.1
None (n=2,055)	1,036	50.4	1,632	79.4	390	19.0	105	5.1	71	3.5	211	10.3	107	5.2	177	8.6	49	2.4
Cocaine/Crack	**				***		***		***		***		***		***		***	
A Lot (n=33)	18	54.5	23	69.7	9	27.3	9	27.3	7	21.2	10	30.3	6	18.2	7	21.2	7	21.2
Some (n=46)	35	76.1	39	84.8	23	50.0	8	17.4	17	37.0	15	32.6	7	15.2	16	34.8	9	19.6
None (n=2,039)	1,018	49.9	1,617	79.3	376	18.4	106	5.2	55	2.7	197	9.7	104	5.1	166	8.1	42	2.1
Other Drugs	***		***		***				***		***		***		***		***	
A Lot (n=36)	19	52.8	25	69.4	11	30.6	7	19.4	8	22.2	8	22.2	8	22.2	8	22.2	8	22.2
Some (n=103)	85	82.5	98	95.1	55	53.4	20	19.4	17	16.5	42	40.8	15	14.6	33	32.0	14	13.6
None (n=1,979)	967	48.9	1,556	78.6	342	17.3	96	4.9	54	2.7	172	8.7	94	4.7	148	7.5	36	1.8

[1]Source of Data: Adolescent Questionnaires; Total N: 2,118

*** $p < .001$; ** $p < .01$; * $p < .05$

Respondents were also asked to rate their friends' attitudes towards the respondent's use of these substances. The number of respondents reporting lifetime use of each substance by peer attitudes is presented in Table 6.3. Once again, the general pattern was quite consistent with the pattern found with the other peer variables discussed above. For all substances, adolescents who indicated that their peers would disapprove of their drug use were least likely to report lifetime use themselves. One unexpected finding was that, for many substances, adolescents who indicated that their friends would not care about their use were more likely to report that they had used drugs than were respondents who indicated that their friends would approve of their use. For example, 84.2% of respondents who indicated that their peers would approve of their alcohol use had ever drank alcohol, compared to 89.4% of respondents who said that their friends would not care about their use. Similar to the situation with peer pressure towards substance use, it may be that disapproval from friends is a deterrent to use, while approval or ambivalence are perceived in the same way by adolescents, and do not differentially affect the likelihood that they will use drugs.

The results related to peer factors and substance use are consistent with earlier studies, and emphasize the substantial relationship between peer behaviours and attitudes and adolescent substance use.

6.2 School Factors

Adolescents were asked questions dealing with their performance in school, as well as their impressions of the school they attended. Specifically, they were asked their grade average in school, whether they had skipped school in the past four weeks, and whether they had ever thought about dropping out. In addition, students were asked a series of eight questions related to their perceptions of their school environment. Examples of these questions include: "The school I attend is good for me"; "The appearance of my school is clean, attractive and inviting"; and, "There is a lot of fighting between students in or around my school." Each question was answered on a four-point scale ranging from "Strongly Agree" to "Strongly Disagree," and responses were summed to yield a single School Climate score. Scores were then categorized into Negative, Neutral, or Positive School Climate. Findings relative to the relationship between each of these factors and lifetime substance use are presented in Table 6.4.

Results comparing grade averages in school and substance use were quite consistent across all substances and indicated that students with lower grades in school were substantially more likely to report having used any substance. For example, 80.5% of students who reported grade averages of 50% or less had used tobacco, compared to only 23.7% of students whose grades fell in the 90-100% range. Similarly, 57.3% of students with average grades less than 50% had used marijuana, in contrast to 6.8% of students with grades in the 90-100% range. This pattern also held for the least commonly used substances where, for example, 20.7% of students whose grade averages were less than 50% reported using barbiturates/tranquilizers, in comparison to 5.1% of students with grades in the 90-100% range. Clearly, this pattern of results is consistent with earlier work linking poor school performance with substance use.

TABLE 6.3

NUMBER OF ADOLESCENT RESPONDENTS EVER USING SUBSTANCES BY PEER ATTITUDES TOWARD SUBSTANCE USE[1]

Peer Attitude Toward Substance Use	Tobacco		Alcohol		Marijuana/ Hashish		Glue/ Solvents		Cocaine/ Crack		Halluci- nogens		Barbiturates/ Tranquilizers		Amphetamines /Stimulants		Narcotics	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Tobacco		***		***		***		***		***		***		***		***		***
Approve (n=171)	109	63.7	144	84.2	46	26.9	19	11.1	17	9.9	34	19.9	18	10.5	23	13.5	9	5.3
Would Not Care (n=952)	650	68.3	851	89.4	289	30.4	73	7.7	53	5.6	155	16.3	76	8.0	122	12.8	39	4.1
Disapprove (n=995)	312	31.4	684	68.7	73	7.3	31	3.1	9	0.9	33	3.3	23	2.3	44	4.4	10	1.0
Alcohol		***		***		***		**		***		***		***		***		***
Approve (n=373)	208	55.8	339	90.9	81	21.7	29	7.8	19	5.1	48	12.9	29	7.8	47	12.6	18	4.8
Would Not Care (n=1,059)	678	64.0	951	89.8	289	27.3	72	6.8	55	5.2	158	14.9	77	7.3	122	11.5	36	3.4
Disapprove (n=686)	185	27.0	389	56.7	38	5.5	22	3.2	5	0.7	16	2.3	11	2.9	20	2.9	4	0.6
Marijuana/Hashish		***		***		***		***		***		***		***		***		***
Approve (n=89)	68	76.4	79	88.8	60	67.4	16	18.0	16	18.0	44	49.4	17	19.1	25	28.1	7	7.9
Would Not Care (n=454)	311	68.5	401	88.3	201	44.3	47	10.4	41	9.0	113	24.9	52	11.5	70	15.4	27	5.9
Disapprove (n=1,575)	692	43.9	1,199	76.1	147	9.3	60	3.8	22	1.4	65	4.1	48	3.0	94	6.0	24	1.5
Glue/Solvents						***		***		***		***		***		***		***
Approve (n=28)	17	60.7	24	85.7	13	46.4	9	32.1	6	21.4	11	39.3	11	39.3	10	35.7	4	14.3
Would Not Care (n=333)	184	55.3	272	81.7	76	22.8	45	13.5	23	6.9	45	13.5	22	6.6	37	11.1	14	4.2
Disapprove (n=1,757)	870	49.5	1,383	78.7	319	18.2	69	3.9	50	2.8	166	9.4	84	4.8	142	8.1	40	2.3
Cocaine/Crack		**				***		***		***		***		***		***		***
Approve (n=32)	22	68.8	24	75.0	19	59.4	9	28.1	12	37.5	14	43.8	9	28.1	10	31.3	6	18.8
Would Not Care (n=267)	156	58.4	215	80.5	77	28.8	28	10.5	30	11.2	55	20.6	22	8.2	32	12.0	16	6.0
Disapprove (n=1,819)	893	49.1	1,440	79.2	312	17.2	86	4.7	37	2.0	153	8.4	86	4.7	147	8.1	36	2.0
Other Drugs		***		**		***		***		***		***		***		***		***
Approve (n=56)	41	73.2	50	89.3	38	67.9	12	21.4	11	19.6	31	55.4	18	32.1	23	41.1	8	14.3
Would Not Care (n=350)	227	64.9	296	84.6	128	36.6	41	11.7	37	10.6	86	24.6	39	11.1	49	14.0	24	6.9
Disapprove (n=1,712)	803	46.9	1,333	77.9	242	14.1	70	4.1	31	1.8	105	6.1	60	3.5	117	6.8	26	1.5

[1]Source of Data: Adolescent Questionnaires; Total N: 2,118

*** $p < .001$; ** $p < .01$; * $p < .05$

TABLE 6.4

NUMBER OF ADOLESCENT RESPONDENTS EVER USING SUBSTANCES BY SCHOOL RELATED FACTORS[1]

School Factors	Tobacco		Alcohol		Marijuana/ Hashish		Glue/ Solvents		Cocaine/ Crack		Halluci- nogens		Barbiturates/ Tranquilizers		Amphetamines /Stimulants		Narcotics	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Grades in School[2]	***		***		***		***		***		***		***		***		***	
< 50% (n=82)	66	80.5	75	91.5	47	57.3	12	14.6	14	17.1	21	25.6	17	20.7	17	20.7	7	8.5
50-59% (n=265)	188	70.9	232	87.5	101	38.1	27	10.2	19	7.2	59	22.3	30	11.3	41	15.5	14	5.3
60-69% (n=580)	351	60.5	486	83.8	150	25.9	37	6.4	26	4.5	75	12.9	33	5.7	63	10.9	21	3.6
70-79% (n=642)	281	43.8	494	76.9	67	10.4	32	5.0	13	2.0	45	7.0	23	3.6	41	6.4	8	1.2
80-89% (n=438)	140	32.0	316	72.1	27	6.2	10	2.3	1	0.2	13	3.0	9	2.1	16	3.7	4	0.9
90-100% (n=59)	14	23.7	35	59.3	4	6.8	3	5.1	3	5.1	4	6.8	3	5.1	3	5.1	3	5.1
School Attendance Past 4 Weeks[3]	***		***		***		**		***		***		***		***		***	
Skipped (n=545)	372	68.3	498	91.4	216	39.6	45	8.3	45	8.3	128	23.5	68	12.5	97	17.8	40	7.3
Did Not Skip (n=1,573)	699	44.4	1,181	75.1	192	12.2	78	5.0	34	2.2	94	6.0	49	3.1	92	5.8	18	1.1
Thought About Dropping Out[3]	***		***		***		***		***		***		***		***		***	
Yes (n=265)	210	79.2	246	92.8	133	50.2	35	13.2	41	15.5	74	27.9	41	15.5	53	20.0	21	7.9
No (n=1,853)	861	46.5	1,433	77.3	275	14.8	88	4.7	38	2.1	148	8.0	76	4.1	136	7.3	37	2.0
School Climate[3]	***		***		***		***		***		***		***		***		***	
Negative (n=190)	127	66.8	168	88.4	62	32.6	26	13.7	19	10.0	39	20.5	30	15.8	41	21.6	16	8.4
Neutral (n=1,656)	849	51.3	1,328	80.2	317	19.1	88	5.3	56	3.4	168	10.1	81	4.9	135	8.2	39	2.4
Positive (n=272)	95	34.9	183	67.3	29	10.7	9	3.3	4	1.5	15	5.5	6	2.2	13	4.8	3	1.1

[1]Source of Data: Adolescent Questionnaires

[2]Missing Observations on Grades in School: 52. Total N: 2,066

[3]Total N: 2,118

*** $p < .001$; ** $p < .01$; * $p < .05$

In terms of school attendance, once again the findings were very consistent across substances, and indicated that students who had skipped school within the past four weeks were substantially more likely to have ever used substances than were students who had not skipped. For example, students who had not skipped school were over three times less likely to have used marijuana/hashish than were those who had skipped (12.2% compared to 39.6%). Similar to the relationship found between school grades and substance use, the difference between students who skipped and those who did not was found for both the most commonly used drugs, as well as those that are less commonly used.

Responses to the question whether students had ever thought of dropping out of school were also strongly related to drug use, and indicated, for all substances, that students who reporting thinking about dropping out were substantially more likely to report lifetime use. For some substances, these differences were quite dramatic such as with cocaine/crack, where students who had thought about dropping out were over seven times as likely to report use than were students who had not thought about dropping out (15.5% vs. 2.1%). Similarly, 50.2% of respondents who indicated that they had thought about dropping out had used marijuana/hashish, compared to only 14.8% of students who had not thought of dropping out.

Finally, data collected from the School Climate scale indicated a strong relationship between students' perceptions of their school and their substance use patterns. For all substances, students who reported a positive school climate were least likely to report ever using substances, while students who reported a negative school climate were most likely to report substance use. Students who indicated a neutral school climate fell between these two extremes on lifetime substance use. For example, 88.4% of students who reported a negative school climate had ever drank alcohol, compared to 80.2% of students reporting a neutral climate and 67.3% of students reporting a positive climate. Similarly, 32.6% of respondents who reported a negative climate had used marijuana/hashish, compared to 19.1% of students who reported a neutral climate and 10.7% who reported a positive climate.

Taken together, the results obtained in this study in relation to school factors and substance use are consistent with earlier research, and indicate that students who report having problems in school, both academically and otherwise, are substantially more likely also to report the use of drugs.

6.3 Extracurricular Activities

The adolescent respondents were asked questions related to their participation in various extracurricular activities that included adult leadership or instruction. Specifically, they were asked if they participated in coached sports, organized non-sport activities or lessons (e.g., music, art, etc.), or belonged to any clubs with adult leadership. Table 6.5 presents data on the relationship between these factors and substance use.

TABLE 6.5

NUMBER OF ADOLESCENT RESPONDENTS EVER USING SUBSTANCES BY PARTICIPATION IN EXTRACURRICULAR ACTIVITIES[1]

Extracurricular Activities	Tobacco		Alcohol		Marijuana/ Hashish		Glue/ Solvents		Cocaine/ Crack		Halluci- nogens		Barbiturates/ Tranquilizers		Amphetamines /Stimulants		Narcotics	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Sports with Adult Leadership Instruction	**				***				*		**		*		*			
No (n=1,070)	572	53.5	841	78.6	256	23.9	71	6.6	50	4.7	134	12.5	70	6.5	112	10.5	31	2.9
Yes (n=1,048)	499	47.6	838	80.0	152	14.5	52	5.0	29	2.8	88	8.4	47	4.5	77	7.3	27	2.6
Non-Sport with Adult Leadership	***				***		*				*						*	
No (n=1,543)	815	52.8	1,237	80.2	334	21.6	100	6.5	64	4.1	177	11.5	86	5.6	148	9.6	50	3.2
Yes (n=575)	256	44.5	442	76.9	74	12.9	23	4.0	15	2.6	45	7.8	31	5.4	41	7.1	8	1.4
Clubs with Adult Leadership	***		***		***				*		***							
No (n=1,444)	776	53.7	1,174	81.3	331	22.9	88	6.1	63	4.4	175	12.1	86	6.0	140	9.7	44	3.0
Yes (n=674)	295	43.8	505	74.9	77	11.4	35	5.2	16	2.4	47	7.0	31	4.6	49	7.3	14	2.1

[1]Source of Data: Adolescent Questionnaires; Total N: 2,118

*** $p < .001$; ** $p < .01$; * $p < .05$

Results comparing participation in sports activities and substance use indicated that, for most substances, adolescents who reported participation were less likely to report lifetime use than were students who did not participate although, for some substances, this difference was not particularly large. For example, 47.6% of students who did participate in sports reported tobacco use, compared with 53.5% of students who did not report participation. For marijuana/hashish, 14.5% of respondents who did participate in sports reported lifetime use, in comparison to 23.9% of students who did not participate. Interestingly, students who did participate in sports were slightly more likely to report lifetime use of alcohol than were non-participating students (80% compared to 78.6%).

Results for both participation in organized non-sport activities and membership in clubs and their relationship with substance use were similar, and indicated that students who reported participation were less likely to report use than were students who did not participate. This pattern was observed for all substances although, once again, the differences were not particularly large for some. For example, 21.6% of students who did not participate in non-sport activities had used marijuana/hashish, compared with 12.9% of participating students. Similarly, 22.9% of students who did not belong to clubs had used marijuana/hashish, in contrast to 11.4% of students who did report club membership.

The results related to extracurricular activities and substance use once again are consistent with earlier findings, and do provide evidence which suggests that adolescents who take part in activities with adult leadership are less likely to use substances.

7.0 Intrapersonal Factors Associated with Adolescent Substance Use

In addition to interpersonal or social environmental factors, adolescent drug involvement has been linked to several intrapersonal factors, including behavioural and personality characteristics. A strong relationship has been shown between adolescent drug use and other problem behaviours (Donovan & Jessor, 1985; Ensminger, 1990; Farrell, Danish & Howard, 1992; Jessor & Jessor, 1977). For example, adolescents who exhibit some behavioural problems (e.g., precocious sexual activity, delinquency, vandalism, aggression, and hostility) are more likely to be engaged in drug-using behaviour. Similarly, substance use among adolescents may be associated with self-reported psychiatric disorders (Boyle & Offord, 1991; Cantwell, 1988; Offord, Boyle & Racine, 1989). For example, some studies have found that teenagers who experience some types of disorders (in particular conduct disorder, which includes problem behaviour characteristics) were somewhat more likely to be involved in substance use.

A number of personality traits or characteristics have also been related to drug involvement among teenagers. Self-esteem is the personality trait most often implicated as a precursor to substance use by adolescents (Hicks, Hicks & Bodle, 1992; Stein, Newcomb & Bentler, 1987). The drug-using adolescent typically scores lower on self-esteem measures than does the non-drug-using adolescent.

To investigate the relationship between intrapersonal factors and lifetime use of a variety of substances, adolescents were asked a number of questions about how they viewed themselves and their behaviour. A series of questions was also included to measure the extent of their sexual experience. For purposes of this report, only the responses to the question on sexual intercourse are included. To examine the association between several self-reported psychiatric disorders and adolescent substance use, the behaviour checklist developed by Offord and his associates was employed (Boyle & Offord, 1991). The checklist consists of a number of items that measure the absence or presence, and severity of the following disorders: conduct disorders, emotional disorders, attention-deficit or hyperactivity disorders, and somatization disorders. Self-esteem, as a global construct to assess a general sense of well-being, was measured using Rosenberg's Self-Esteem Scale (Rosenberg, 1965), which has been used extensively in studies of adolescents.

7.1 Sexual Behaviour

Respondents were asked to indicate how often they had engaged in sexual intercourse. The relationship between this item and lifetime substance use is presented in Table 7.1. The findings were quite consistent across substances and indicated that students who reported that they had often engaged in sexual intercourse were substantially more likely to report lifetime substance use than were students who had never engaged in intercourse. The likelihood that students who reported that they had engaged in intercourse once or a few times had used substances fell between these two extremes. For many substances, the greatest difference in the proportion of users within each response category was between the "Never" and "Once" categories, thus suggesting that adolescents who had ever engaged in sexual intercourse are substantially more likely to report drug use. Perhaps the best example of this pattern is in the case of marijuana/hashish, where 62.2% of respondents who indicated that they have had sexual intercourse often reported lifetime use, in contrast to 40.9% of students who reported that they have had intercourse a few times, 37.2% of students who reported that they have had intercourse once, and only 8.5% of the students who have never engaged in intercourse. Clearly, these results are consistent with previous findings indicating a strong relationship between early sexual behaviour and drug use.

7.2 Psychological and Personality Variables

As noted above, respondents completed four survey scales designed to assess the presence or absence of specific psychiatric disturbances. The relationship between scores on these scales and substance use is presented in Table 7.1. The results were quite consistent for all substances across all four scales. In all cases, adolescents who fell above the threshold score for clinical presence of the disorder were substantially more likely to report lifetime use of substances than were those who scored low on the scales. Similarly, the probability of substance use among respondents who scored in the moderate range of the scales fell between these two extremes. For example, 78.4% of adolescents who fell above the clinical threshold on the Conduct Disorder scale had used tobacco, compared with only 36% of low scorers. In addition, 32.7% of respondents who scored above the clinical threshold on the Hyperactivity Disorder scale reported use of marijuana/hashish, compared with 13.9% of low scorers.

Results obtained with the self-esteem scale were also quite consistent across substances, and indicated that, for all drugs, students who scored low were more likely to report substance use than were high scorers. For example, 72.3% of students with low self-esteem scores had used tobacco, in contrast to 40.2% of those with high scores. For amphetamines/stimulants, low scorers were almost three times as likely to report lifetime use than were high scorers (18.8% vs. 6.6%).

Clearly, the results obtained with the present sample are consistent with previous findings that have indicated that the presence of behavioural and psychological problems are associated with higher levels of substance use.

TABLE 7.1

NUMBER OF ADOLESCENT RESPONDENTS EVER USING SUBSTANCES BY INTRAPERSONAL FACTORS[1]

Intrapersonal Factors	Tobacco		Alcohol		Marijuana/ Hashish		Glue/ Solvents		Cocaine/ Crack		Halluci- nogens		Barbiturates/ Tranquilizers		Amphetamines /Stimulants		Narcotics	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Frequency of Sexual Intercourse[2]	***		***		***		**		***		***		***		***		***	
Often (n=201)	166	82.6	194	96.5	125	62.2	21	10.4	32	15.9	80	39.8	41	20.4	56	27.9	18	9.0
A Few Times (n=186)	137	73.7	179	96.2	76	40.9	15	8.1	16	8.6	43	23.1	19	10.2	37	19.9	11	5.9
Once (n=94)	62	66.0	88	93.6	35	37.2	7	7.4	8	8.5	17	18.1	5	5.3	12	12.8	8	8.5
Never (n=1,146)	469	40.9	838	73.1	97	8.5	49	4.3	10	0.9	39	3.4	30	2.6	53	4.6	12	1.0
Conduct Disorder[3]	***		***		***		***		***		***		***		***		***	
Clinical (n=231)	181	78.4	211	91.3	118	51.1	45	19.5	40	17.3	78	33.8	46	19.9	60	26.0	27	11.7
Moderate (n=849)	516	60.8	740	87.2	205	24.1	54	6.4	29	3.4	105	12.4	53	6.2	82	9.7	22	2.6
Low (n=1,038)	374	36.0	728	70.1	85	8.2	24	2.3	10	1.0	39	3.8	18	1.7	47	4.5	9	0.9
Emotional Disorder[3]	***		***		***		***		***		***		***		***		**	
Clinical (n=234)	157	67.1	206	88.0	69	29.5	27	11.5	18	7.7	46	19.7	33	14.1	47	20.1	13	5.6
Moderate (n=778)	422	54.2	639	82.1	167	21.5	52	6.7	34	4.4	83	10.7	45	5.8	82	10.5	26	3.3
Low (n=1,106)	492	44.5	834	75.4	172	15.6	44	4.0	27	2.4	93	8.4	39	3.5	60	5.4	19	1.7
Hyperactivity Disorder[3]	***		***		***		***		***		***		***		***		***	
Clinical (n=110)	79	71.8	99	90.0	36	32.7	19	17.3	12	10.9	22	20.0	18	16.4	21	19.1	8	7.3
Moderate (n=804)	479	59.6	679	84.5	205	25.5	59	7.3	41	5.1	110	13.7	61	7.6	107	13.3	30	3.7
Low (n=1,204)	513	42.6	901	74.8	167	13.9	45	3.7	26	2.2	90	7.5	38	3.2	61	5.1	20	1.7
Somatization Disorder[3]	***		***		***		***		***		***		***		***		***	
Clincial (n=273)	195	71.4	245	89.7	78	28.6	30	11.0	21	7.7	47	17.2	42	15.4	60	22.0	18	6.6
Moderate (n=766)	405	52.9	608	79.4	163	21.3	48	6.3	31	4.0	91	11.9	42	5.5	73	9.5	23	3.0
Low (n=1,079)	471	43.7	826	76.6	167	15.5	45	4.2	27	2.5	84	7.8	33	3.1	56	5.2	17	1.6
Self-Esteem[3]	***		***		***		***				***		***		***			
Low (n=202)	146	72.3	180	89.1	60	29.7	24	11.9	12	5.9	41	20.3	25	12.4	38	18.8	9	4.5
Moderate (n=1,645)	816	49.6	1,294	78.7	305	18.5	89	5.4	54	3.3	155	9.4	82	5.0	133	8.1	42	2.6
High (n=271)	109	40.2	205	75.6	43	15.9	10	3.7	13	4.8	26	9.6	10	3.7	18	6.6	7	2.6

[1]Source of Data: Adolescent Questionnaires

[2]Respondents from Edmonton and Calgary Catholic School Districts were not asked this question, and thus are not included in this analysis; Total N: 1,627.

[3]Total N: 2,118

*** $p < .001$; ** $p < .01$; * $p < .05$

8.0 Summary and Conclusions

The major objectives of this study investigate the scope and nature of adolescent substance use in Alberta, and explore the factors related to lifetime use of a variety of substances. A major focus of this study was to examine the relationship between a variety of family characteristics as well as other social and personal factors, and drug-using behaviour among adolescents. The preliminary findings of this study are summarized in this chapter according to the five major objectives:

(1) To investigate the prevalence and frequency of substance use among Alberta adolescents.

(2) To investigate the demographic factors associated with adolescent substance use.

(3) To investigate the relationship between family characteristics and adolescent substance use.

(4) To investigate the relationship between other interpersonal and school factors and adolescent substance use.

(5) To investigate the relationship between intrapersonal factors and adolescent substance use.

8.1 Prevalence and Frequency of Adolescent Substance Use in Alberta

The findings of this study suggest that the prevalence of substance use among this sample of Alberta youth is comparable to lifetime, annual, and monthly rates reported in studies conducted elsewhere. Highlights of the findings include:

- Alcohol and tobacco were the most widely used substances among adolescents in this sample, with 50.6% of respondents reporting lifetime use of tobacco, and almost 80% reporting lifetime use of alcohol.

- A smaller but substantial number of respondents reported lifetime use of marijuana/hashish (19.3%), hallucinogens (10.5%), and amphetamines/stimulants (8.9%).

- Few adolescents reported use of other substances such as glue/solvents (5.8%), barbiturates/tranquilizers (5.5%), cocaine/crack (3.7%), and narcotics (2.7%).

- Alberta adolescents appear to be somewhat more likely to be using most substances than adolescents in other parts of Canada.

- For all substances, adolescents who reported lifetime use were also likely to report use in the past 12 months and past four weeks, possibly indicating continued use.

- Tobacco, alcohol, and marijuana/hashish had the largest proportion of high frequency users, with 14.7% of respondents reporting high frequency use of tobacco, 9.8% reporting high frequency use of alcohol, and 3% reporting high frequency use of marijuana/hashish.

- Overall, the majority of substance users in this study were using substances infrequently.

8.2 Demographic Factors Associated with Adolescent Substance Use

Consistent with previous drug-use surveys, adolescent and family demographic characteristics were found to be related to differences in lifetime use of various drugs. Highlights of the findings include:

- Males were somewhat more likely than females to be lifetime users of marijuana/hashish, glue/solvents, cocaine/crack, hallucinogens, and narcotics.

- Females were more likely than males to report lifetime use of tobacco and amphetamines/stimulants, and somewhat more likely to report lifetime use of alcohol and barbiturates/tranquilizers.

- For the majority of substances, lifetime use tended to increase steadily with age, with the exception of tobacco, where lifetime use declined after age 16.

- For most substances, adolescents who reported no religious affiliation were slightly more likely to report lifetime use than those who reported an affiliation.

- Adolescents living in small urban/rural communities were somewhat more likely to report lifetime use of tobacco, alcohol, and amphetamines/stimulants, while the use of glue/solvents, cocaine/crack, and hallucinogens was more prevalent among adolescents living in large urban centres.

- Those adolescents who reported living with both parents were somewhat less likely to report lifetime use of all substances except alcohol than adolescents who lived with either a single parent or in a reconstituted family.

8.3 Family Factors Associated with Adolescent Substance Use

Similar to previous studies, the quality and nature of the family life was strongly related to adolescent substance use and non-use. For all substances, adolescents who reported a high level of family functioning, a positive family environment, high parental monitoring, or high parental

involvement were less likely to report lifetime use of substances. Results of the present study clearly indicate that the perceived level of family functioning, perceptions of the family environment, degree of parental monitoring, and level of parental involvement were among the most strongly related factors to adolescent substance use. Highlights of the present study in relation to these factors are:

- For all substances, adolescents who lived with a parent who used any substance were more likely to report having used a substance at least once in their lifetime.

- Adolescents living in families that were perceived by the adolescent to be dysfunctional reported substantially higher rates of substance use.

- Those adolescents who reported a positive family environment with high levels of trust, respect, and parental support were less likely to report any substance use.

- Adolescents from families characterized by a high degree of parental monitoring were also less likely to report lifetime use.

- Students from families where there was a high level of parental involvement in their activities were less likely to report substance use.

8.4 Interpersonal and School Factors Associated with Adolescent Substance Use

Not unlike previous studies, the present findings suggest that the drug attitudes and behaviours of peers, school performance, overall school climate, and participation in extracurricular activities with adult leadership, are all related to substance use among adolescents in this sample. Highlights of these results are:

- Adolescents who reported any substance use among their peers, peer pressure to use substances, or general acceptance of substance use among their peers were more likely to report lifetime use as well. In most cases, these relationships were strongest when the same substances were compared for both respondents and their peers.

- Across all substances, students who were experiencing problems at school (i.e., low overall grades, skipped classes, or thought about dropping out) and reported a negative school climate were more likely also to report lifetime use of drugs.

- Adolescents who did not participate in activities with adult leadership or instruction were more likely to report lifetime use of most substances.

8.5 Intrapersonal Factors Associated with Adolescent Substance Use

Although the present findings indicate that characteristics of the family as well as a number of other interpersonal factors were related to substance use among young people, other intrapersonal factors were also linked to drug use. The perceptions that adolescents held of themselves and their behaviour appeared to be associated with the decision to use tobacco, alcohol, and other drugs. Adolescents who reported some type of behavioural, emotional, or psychological problem or adolescents with a negative self-concept had a greater tendency to report lifetime substance use. Highlights of these results are:

- Students who reported that they had engaged in sexual intercourse at least once reported higher rates of use for all substances included in this survey.

- For all substances, students who scored high on measures of Conduct Disorder, Emotional Disorder, Hyperactivity, and Somatization reported higher lifetime rates of use than students who scored low.

- Adolescents who scored low on the measure of self-esteem also tended to report higher rates of substance use than respondents who scored high.

8.6 Conclusions

The results of this study suggest that a significant number of adolescents in Alberta have used and are currently using tobacco, alcohol, and other drugs. Of all substances for which information was collected, tobacco, alcohol, and marijuana/hashish were clearly the substances of choice as reflected by the substantially high numbers of students reporting use. In fact, over one-half of respondents reported using tobacco, almost eight out of every ten adolescents reported the use of alcohol, and almost one out of every five respondents had used marijuana/hashish at least once. Despite these substantial rates of use for these substances, it is encouraging to note that use of all other substances was relatively low. Equally encouraging is the finding that typically students who reported using substances also reported that they are using them with a relatively low frequency. This would suggest that, for most substances with the exception of tobacco and alcohol, drug use is a relatively infrequent activity for Alberta youth.

An overview of the findings indicates that substance use among Alberta adolescents was related to a variety of demographic, family, peer group, school, and personality factors. Of particular interest is the strong and consistent relationship between positive aspects of family life and lower reported drug use. For example, the substantial relationship between parent(s)' substance use and that of their children suggests that when parents set an example by not using substances, their children were also substantially more likely to refrain from use. In addition, when adolescents' ratings of their family atmosphere, as measured on several dimensions such as family functioning, family environment, parental monitoring of their behaviour, and parental involvement in their activities, were positive, they were also considerably less likely to report

use of a variety of substances. Clearly, these findings indicate that a strong, positive, and stable family atmosphere is a significant factor for suppressing the use of substances by adolescents. This would suggest that any substance use prevention policy and programming must acknowledge the important role that the family may play in preventing drug use. Thus, policies and programs that promote healthy, stable families may go a long way in preventing substance use and abuse among Alberta youth.

In addition to the significant relationship between family characteristics and adolescent substance use, the findings of this survey also indicate that adolescents' peer and social relationships are strongly associated with substance use. Students whose peer group consisted of a substantial number of friends who did not use substances and whose attitudes towards the use of substances were negative were significantly less likely to report substance use themselves. Also, students who reported that they were involved in extracurricular activities that included adult supervision or instruction were less likely to report substance use. These findings suggest that the promotion of healthy interpersonal relationships with a positive peer group and fostering participation in structured supervised social activities may help to reduce the use of substances.

It was clear from the present findings that students' performance in, and perceptions of, school also were significantly related to their reported substance use. Adolescents who reported a high level of academic achievement, who had not skipped school in the past month, and who had not thought about dropping out were considerably less likely to use substances. In addition, students who reported a positive school climate were less likely to report drug use. These findings point to the importance of the association between school factors and substance use, and suggest that students who feel positive about their school performance and their school's environment may be less likely to begin using tobacco, alcohol, and other drugs.

Overall, the results of the present survey provide strong support for the theory that students who report that their family and personal lives are generally positive, as this is defined in a variety of ways, are typically less likely to have a need or desire to use various drugs than adolescents who report that they are having problems. This suggests that social programs and policies, which have as their aim promoting stable and healthy family and peer environments for children, may substantially reduce substance use and abuse among these young Albertans.

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APPENDIX A

SUPPORTING TABLES

APPENDIX A

LIST OF TABLES

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TABLE A-2.1

A BREAKDOWN OF RESPONSE RATES BY SCHOOL DISTRICT FOR ADOLESCENT QUESTIONNAIRES

School District	Total Sample	Total Exclusions	Total Sample Possible[1]	Valid Questionnaires Received	Response Rate Out of Total Sample (%)[2]	Response Rate Out of Total Possible (%)[3]
Calgary Public	910	166	744	539	59.2	72.4
Calgary Catholic	301	44	257	191	63.5	74.3
Edmonton Public	820	125	695	451	55.0	64.9
Edmonton Catholic	447	64	383	300	67.1	78.3
Red Deer Catholic	149	19	130	115	77.2	88.7
St. Paul Education	160	19	141	112	70.0	79.4
St. Paul County	213	29	184	143	67.1	77.7
Peace River Division # 10	240	14	226	169	70.4	74.8
Peace River Catholic	150	9	141	98	65.3	69.5
TOTAL	3,390	489	2,901	2,118	62.5	73.0

[1]Total Sample Possible = Total Sample - Total Exclusions.

[2]Response Rate Out of Total Sample = Valid Questionnaires Received/Total Sample.

[3]Response Rate Out of Total Possible = Valid Questionnaires Received/Total Sample Possible.

TABLE A-2.2

A BREAKDOWN OF RESPONSE RATES
BY SCHOOL DISTRICT FOR PARENT QUESTIONNAIRES

School District	Total Mailed Out	Valid Questionnaires Returned	Response Rate (%)
Calgary Public	744	372	50.0
Calgary Catholic	257	145	56.4
Edmonton Public	695	269	38.7
Edmonton Catholic	383	166	43.3
Red Deer Catholic	130	75	57.7
St. Paul Education	141	64	45.4
St. Paul County	184	81	44.0
Peace River Division # 10	226	133	58.8
Peace River Catholic	141	83	58.9
TOTAL	2,901	1,388	47.8

TABLE A-2.3

NUMBER OF ADOLESCENT AND PARENT QUESTIONNAIRES MATCHED BY SCHOOL DISTRICT

School District	Total Parent Questionnaire Available for Matching	Total Questionnaires Matched	Matching Rate (%)
Calgary Public	372	262	70.4
Calgary Catholic	145	103	71.0
Edmonton Public	269	193	71.8
Edmonton Catholic	166	125	75.3
Red Deer Catholic	75	54	72.0
St. Paul Education	64	49	76.6
St. Paul County	81	63	77.8
Peace River Division # 10	133	83	62.4
Peace River Catholic	83	53	63.9
TOTAL	1,388	985	71.0

TABLE A-3.1

PREVALENCE OF ADOLESCENT SUBSTANCE USE IN LIFETIME, PAST TWELVE MONTHS, AND PAST FOUR WEEKS[1]

SUBSTANCE	Ever Used		Used in the Past 12 months		Used in the Past 4 weeks	
	n	%	n	%	n	%
Tobacco	1,071	50.6	848	40.0	548	25.9
Alcohol	1,679	79.3	1,364	64.4	939	44.3
Marijuana/Hashish	408	19.3	344	16.2	217	10.2
Glue/Solvents	123	5.8	71	3.4	26	1.2
Cocaine/Crack	79	3.7	56	2.6	29	1.4
Hallucinogens	222	10.5	190	9.0	102	4.8
Barbiturates/Tranquilizers	117	5.5	92	4.3	54	2.5
Amphetamines/Stimulants	189	8.9	154	7.3	72	3.4
Narcotics	58	2.7	44	2.1	25	1.2

[1]Source of Data: Adolescent Questionnaires
% for all cells based on total N: 2,118

TABLE A-3.2

CRITERIA USED FOR CLASSIFICATION INTO LOW, MODERATE AND HIGH FREQUENCY USER CATEGORIES BY SUBSTANCE[1]

SUBSTANCE	Low Frequency Response Alternatives	Moderate Frequency Response Alternatives	High Frequency Response Alternatives
Tobacco	Not at all Once or twice	Once a month or less 2 or 3 times a month Once a week 2 or 3 times a week 4 or 5 times a week	6 or 7 times a week
Alcohol	Not at all Had a sip Once or twice at special events	Once a month or less 2 or 3 times a month	Once a week 2 or 3 times a week 4 or 5 times a week 6 or 7 times a week
All Other Substances	Not at all Once or twice	3 to 5 times 6 to 9 times 10 to 19 times	20 to 39 times 40 or more times

[1]Response alternatives are from questions asking about frequency of use of each substance in the past 12 months.

TABLE A-3.3

FREQUENCY OF ADOLESCENT SUBSTANCE USE IN PAST TWELVE MONTHS[1]

SUBSTANCE	Never Used		Low Frequency		Moderate Frequency		High Frequency		Total	
	n	%	n	%	n	%	n	%	n	%
Tobacco	1,047	49.4	441	20.8	318	15.0	312	14.7	2,118	100.0
Alcohol	439	20.7	839	39.6	633	29.9	207	9.8	2,118	100.0
Marijuana/ Hashish	1,710	80.7	197	9.3	147	6.9	64	3.0	2,118	100.0
Glue/Solvents	1,995	94.2	101	4.8	16	0.8	6	0.3	2,118	100.0
Cocaine/Crack	2,039	96.3	50	2.4	22	1.0	7	0.3	2,118	100.0
Hallucinogens	1,896	89.5	129	6.1	71	3.4	22	1.0	2,118	100.0
Barbiturates/ Tranquilizers	2,001	94.5	70	3.3	39	1.8	8	0.4	2,118	100.0
Amphetamines/ Stimulants	1,929	91.1	124	5.9	55	2.6	10	0.5	2,118	100.0
Narcotics	2,060	97.3	39	1.8	10	0.5	9	0.4	2,118	100.0

[1]Source of Data: Adolescent Questionnaires
Criteria for classification of respondents into Low, Moderate, and High Frequency Users are presented in Table A-3.2, Appendix A.

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